*FlyBy Math*TM **Alignment** **Mathematics Curriculum Standards** **Content Standards**

ALGEBRA

Standard I. Understand patterns, relations, and functions.

Expectation B. Understand relations and functions and select, convert flexibly among, and use various representations for them.	
	*FlyBy Math*TM **Activities**
*1. Gather and record data, or use data sets, to determine functional (systematic) relationships between quantities.	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios. --Conduct a simulation of each airplane scenario.
*2. Represent relationships among quantities using concrete models, tables, graphs, diagrams, verbal descriptions, equations, and inequalities including representations involving computer algebra systems, spreadsheets, and graphing calculators.	--Represent distance, speed, and time relationships for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.
*3. Interpret situations in terms of given graphs and create situations that fit given graphs.	--Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.

Expectation C. Analyze functions of one variable by investigating rates of change, intercepts, zeros, asymptotes, and local and global behavior.	
	*FlyBy Math*TM **Activities** --Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system. --Interpret the slope of a line in the context of a distance-rate-time problem.

Expectation E. Understand and compare the properties of classes of functions, including exponential, polynomial, rational, logarithmic, and periodic functions.	
	*FlyBy Math*TM **Activities**
*3. Relate direct variation to linear functions and solve problems involving proportional change.	--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system. --Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.

Standard II. Represent and analyze mathematical situations and structures using algebraic symbols.

Expectation B. Write equivalent forms of equations, inequalities and systems of equations and solve them with fluency - mentally or with paper and pencil in simple cases and using technology in all cases.

	FlyBy Math™ Activities
*2. Solve systems of linear equations using concrete models, graphs, tables, and algebraic methods.	--Use tables, graphs, and equations to solve aircraft conflict problems. --Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.

Standard III. Use mathematical models to represent and understand quantitative relationships.

Expectation A. Identify essential quantitative relationships in a situation and determine the class or classes of functions that might model the relationships.

	FlyBy Math™ Activities
*2. Analyze situations involving linear functions and formulate linear equations or inequalities to solve problems.	--Represent distance, speed, and time relationships for constant speed cases using linear equations and a Cartesian coordinate system.

Expectation C. Draw reasonable conclusions about a situation being modeled.

	FlyBy Math™ Activities
1. Verify and explain the conclusion based on the data and the processes used.	--Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation. --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.

Standard IV. Analyze change in various contexts.

Expectation A. Approximate and interpret rates of change from graphical and numerical data.

	FlyBy Math™ Activities
1. Interpret rates of change as they apply to phenomena such as inflation, spread of disease, population growth, tax brackets, and pollution.	--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates. --Interpret the slope of a line in the context of a distance-rate-time problem.
3. Determine changes in slope relative to the changes in the independent variable.	--Interpret the slope of a line in the context of a distance-rate-time problem.

GEOMETRY

Standard IV. Use visualization, spatial reasoning, and geometric modeling to solve problems.

Expectation D. Use geometric models to gain insights into and answer questions about related areas of mathematics and other disciplines.

1. Select an appropriate representation (concrete, pictorial, graphical, verbal, or symbolic) to solve a problem.	*FlyBy Math*[TM] **Activities** --Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.